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UGANDA PROTECTORATE

ANNUAL REPORT

OF THE

Department of Agriculture

FOR THE

Year ended 31st December, 1949

PRICE: TWO SHILLINGS

Published by Command of His Excellency the Governor

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DEPARTMENT OF AGRICULTURE

ANNUAL REPORT

For the Year ended 31st December, 1949

SECTION I.—GENERAL REVIEW

Weather

The dry season in the first months of the year was prolonged and severe and it was not until April that the spring rains became general. The autumn rains were in general satisfactory though there was a period of hot and dry weather during November. The month of December was unusually wet and cool and the rains continued into the New Year. Both in Buganda and in the Eastern Province total rainfall was below average. However, apart from the delayed onset of the spring rains, which seriously retarded the planting of food crops and as a corollary the cotton crop, especially in the Eastern Province, weather conditions after the beginning of April until the end of the year were in general reasonably favourable to plant growth.

Native Agriculture

BUGANDA

The disturbances which occurred at the end of April had many unsettling repercussions on African cultivators which, combined with unfavourable weather, made the year 1949 a difficult one. The cotton crop marketed in 1949 was a record one for the Province, amounting to 106,600 tons of seed cotton; marketing of the crop suffered a series of setbacks due to unrest caused by the disturbances but though it was necessary to prolong the buying season the whole of the crop was ultimately marketed satisfactorily. A further increase in acreage planted with cotton was recorded in 1949 but unfavourable weather during the season reduced crop prospects and a reduction of some twenty per cent. in sales during 1950 is expected.

After the large coffee crop in 1948 it was to be expected that yields of coffee would be under the average during the following season and in fact the after effects of heavy bearing were accentuated by the lack of adequate rainfall.

Maize showed a slight reduction in acreage though the marketable surplus proved to be much larger than was estimated, production for sale amounting to 450,000 bags.

In Mubende good progress was made with the development of the fire-cured tobacco industry. Food supplies were in general adequate though there were local shortages in all three districts, notably in the western part of Masaka, in Buwekula and in Buruli. Soil conservation was kept very much in the forefront of departmental

activities among African cultivators and, in spite of opposition by disaffected elements of the population, good progress can be recorded; the move towards mixed farming has continued, coupled with better management of livestock.

EASTERN PROVINCE

Although a small amount of food planting was done after early showers, the main opening of land for cropping could not take place until April. It was then apparent that the early planting season would be restricted and that a great effort was necessary to secure sufficient food acreage without severe sacrifice of cash crops. Every possible means was adopted to urge intense activity as soon as weather was favourable. The bulk of the finger millet crop was planted in April and May, some six weeks later than normal. As soon as the millet was sown activity was switched to groundnuts which were often interplanted with cassava or maize. During the long dry season sweet potato vines had completely dried and reserves of famine food had been consumed, as a result of which food shortages occurred, notably in Mbale and the north of Busoga. Imported maize-meal was issued for sale through normal trade channels. Lack of vines prevented early replanting of sweet potatoes and the need of many people to seek work for food or cash hindered the planting programme. By dint of a remarkable effort the acreage of grain established by the end of May approached the normal, though owing to the unfavourable season there was some substitution of the more drought-resistant sorghum for finger millet. The groundnut acreage was lower than in the previous year and so was the amount of root crops, though there was a gratifyingly large early planting of cassava in Mbale District. Although cotton planting had to be subordinated to the overriding need to restore food supplies as soon as possible, a fair acreage had been planted in Teso and Busoga by the arrival of the June dry weather. At this time prospects were very doubtful as the finger millet crop had not received the good rainfall necessary during the growing season, root crops were insufficient and the dry weather had returned at the critical time for early cotton planting. During July and August immense progress was made in cotton planting, encouraged by the guaranteed price which it had been announced would be paid to growers and the one shilling bonus payable to African Local Governments. As soon as cotton planting was well advanced the campaign to improve the dubious food position was resumed. A special effort was made to increase sweet potatoes which could either be consumed fresh or dried and stored, and planting in swamp fringes was advocated to minimise drought risks and particularly to avoid the dearth of planting material which had been such a trial early in the year. The acreages of root crops were, by October, promising to reach the normal level but were seriously threatened by the apparent arrival of the dry season in mid-October. Fortunately general storms in December revived the flagging crops and though the acreages were not in all cases as much as could be

desired the food prospects were vastly improved. The wet December lowered the grade of early cotton, then maturing, but improved the condition of the large proportion of late planting and, on balance, enhanced the expectations of production.

NORTHERN PROVINCE

Despite the late rains minor local food shortages only were reported and no call on the grain reserves was necessary. The acreage of the staple food, *Eleusine* millet, during 1949 was well above average and, although conditions were not wholly satisfactory—the total production should suffice until normal harvest in 1950—other supplementary food crops were adequate.

Cotton acreages increased considerably from 266,962 acres in 1948 to 363,743 acres in 1949, i.e. an increase of 96,781 acres. Progress also was made in tobacco acreages in Acholi and West Nile Districts.

Flue-cured tobacco, the production of which is limited by barns, was increased by 173 acres and air-cured by 427 acres, mainly in the West Nile District.

The export of cattle from the Province continued under an organised system.

Soil conservation methods improved, particularly in the retaining between crops, other than cotton, of the uncultivated grass strips which originated in cotton, a development which is an advance on the previous and almost general practice of leaving grass strips in cotton but to dig them up for other crops.

WESTERN PROVINCE

There has been a general increase of the acreage cultivated in all districts except Bunyoro, where the slightly reduced acreage was mostly due to the lack of rain when the tobacco crop should have been planted. In the other districts the increases are mostly: cotton in Toro, groundnuts in Ankole and millets in Kigezi. With the exception of Toro District there has been a general improvement in soil conservation methods throughout the Province and keen interest has been shown in the inter-gombolola soil conservation competitions held in Kigezi and Bunyoro.

Non-Native Agriculture

COFFEE

For the year ended the 30th June, 1949, the crop amounted to 2,581 tons of which 1,612 tons of type 70 and F.A.Q. were supplied under contract to the Ministry of Food in the United Kingdom. The balance of 969 tons was sold in auction on the Mombasa market. The sale of the crop remained in the hands of the Non-Native Coffee Marketing Board and the total value of the crop amounted to £227,247. Prices on the Mombasa market remained high and showed a sharp increase following the revaluation of the pound in September.

TEA

At the end of the year the total licensed acreage was 18,763 acres held under 89 licences issued under the appropriate legislation. Included in this total is 2,838 acres covered by 9 licences issued during the year. Approximately 6,150 acres had been planted at the end of 1949. Production of made tea during the year amounted to 3,360,000 pounds.

Discussions were held between the East African territories with a view to obtaining as high a degree of uniformity as possible in the tea legislation of all three territories. Following these discussions a Bill was introduced into Legislative Council the main purpose of which was to consolidate existing legislation and to merge the existing authorities connected with the tea industry into an advisory and executive Tea Board. This Board will have a measure of autonomy thus enabling the industry itself to control matters connected with its development and expansion and with the allocation of made tea quotas both for local consumption and for export.

Arrangements were made for the establishment of a Tea Research Institute of East Africa which will be financed by tea producers in East Africa from the proceeds of a cess on production and on acreage which each producer is licensed to plant.

SUGAR

Growth of cane on the two estates at Lugazi and Kakira was adversely affected by dry weather and total production of sugar by the two factories during the year amounted to 46,108 tons compared with 64,708 tons in 1948. Of the total produced 19,140 tons were retained in Uganda for local consumption, 20,221 tons were made available to the other East African territories and 3,156 tons were exported to the Sudan and overseas. Demand for sugar in Uganda by Africans continues to increase rapidly and, were it not for the requirements of the other East African territories, the whole of local production could with advantage be consumed internally.

SISAL

The one estate at Masindi Port produced 964 tons of fibre as compared with 1,501 tons in the previous year.

Agricultural Industries

GINNERIES

The number of registered ginneries throughout the Protectorate is 193 of which 155 were in operation during the 1949 ginning season, the remaining 38 ginneries were, for reasons of ginning economy, not used.

During the year although no tangible or concrete reorganisation of the ginning industry was commenced, many discussions were held with those concerned in an endeavour to pave the way for a satisfactory solution to be found to this very complex matter and for putting it into practice.

Reference was made in last year's report to the recommendation that the Buganda Government might purchase a ginnery to be operated by African enterprise. This recommendation has now been put into effect and during the year the Buganda Government purchased Ngogwe Ginnery from the Liverpool Uganda Company Limited, which has been leased to the Uganda Growers Co-operative Union for a period of one year in the first instance.

COFFEE CURING WORKS

Seven licensed curing works continued to operate for the cleaning and grading of the African produced coffee crop, excluding the *Arabica* coffee from Bugishu. This latter coffee is marketed through the Bugishu Coffee Scheme which sends the crop in parchment form to the Kenya Planters' Co-operative Union coffee mills in Nairobi for treatment.

OIL MILLS

Despite the fact that the present milling capacity of the Protectorate greatly exceeds the comparatively limited East African demand for vegetable oils and oilcakes, several firms ventured to erect new oil mills thus tending to aggravate an already unsatisfactory situation. It therefore became necessary in the interest of economy and manufacturing costs, to impose a limitation on the erection of further oil-milling machinery.

Some 58,282 tons of cotton seed and 2,815 tons of groundnuts and simsim were allocated to twenty established oil mills for crushing. This yielded 1,374,640 gallons of oil and 20,931 tons of cake of which some 8,500 tons of cottonseed cake was sold to Kenya for stockfeed, approximately 3,800 tons were utilised on estates in Uganda, while the remainder was exported to the Ministry of Food.

GENERAL.

Licences issued during 1949 by the Commissioner of Customs, East Africa, under the Excise Duties Ordinance, 1937, for the manufacture in Uganda of the undermentioned articles were as follows:—

Article	No. of Licences Issued
Tobacco, cigarettes and cigars	2
Cigars and cheroots	1
Cigars	1
Sugar	2
Tea	12

Soil Conservation

The prolonged and severe dry period during the first three months of the year prevented the growth of the usual grass and weed cover before the onset of the main rains thereby increasing the initial seasonal erosion risks. The acreage under cultivation remained at a high level and in all districts departments concerned directed much attention to increasing and maintaining soil control measures.

In respect of cultivation for annual crops the use of narrow grass strips across the slope was greatly extended while considerable progress was made in protecting land under perennial crops with *Paspalum* grass bunds.

In the mixed farming areas, especially those in the "short grass" country, there was a distinct advance in persuading stock owners to break away from the practice of combining their stock into large herds for ease of herding and as a result this sub-division into smaller herds is bringing about a more rational use of available grazing. It is now a well established practice in such areas as Teso and parts of Lango, for overgrazed areas to be closed by the local councils and reopened after the land has re-established a good grass cover. Progress has also been made in the protection and rotational use of stock-tracks.

The making of compost has been extended, more particularly in the densely populated areas such as Kigezi, and there is an increasing appreciation by cultivators of the value of applications of compost and cattle manure to the land. In Kampala Municipality, and Entebbe and Jinja townships refuse continued to be composted and over 1,200 tons were distributed to cultivators in the vicinity.

Soil conservation competitions were again organised in several districts of the Protectorate and it is gratifying to record the enthusiasm shown by the people concerned. These competitions have gone far in stimulating cultivators to the need for adopting measures to safeguard their land against erosion. No opportunity is lost to impress upon farmers the need for the rational and careful use of land and emphasis is now placed on this subject in all education courses held at Serere and Bukalasa. An interesting development during the year has been the increased use of the cinema for propaganda purposes, the film "The Story of Sayi" was completed and the production of colour film slides on subjects connected with erosion and soil conservation was commenced. "The Story of Sayi" traces the development of soil conservation on Sayi mutalla in Buganda and preliminary showings have met with responsive audiences.

Generally speaking work connected with all aspects of soil conservation has made satisfactory progress although, apart from Kigezi and parts of Bugishu, where the work is most impressive, results have not been spectacular.

Soils and Manures

Work by the Chemical Section on manures followed two main lines, firstly to determine whether the lack of any appreciable response to phosphate on many Uganda soils, if due to the fixation of the phosphate, could be made good by fractional applications of phosphate at intervals. The results were negative. Secondly, following up the first encouraging response to double superphosphate on certain types of "Lunyu" soils in 1948, further trials at Buwunga were laid down using *Eleusine* as the indicator crop, responses to phosphate were

the largest which have yet been obtained in Uganda and were of the order of sixty per cent. A pot experiment on this soil (p.H. 4·6) gave results which contradict suggestions which have been made elsewhere that untreated Uganda rock phosphate is inert.

Work on nitrate accumulation continued and results obtained at Serere follow the same pattern as the preliminary results at Kawanda, namely a considerable build-up (exceeding 200 p.p. million) which begins at the onset of the rains. At Serere land freshly opened up from grass shows a similar lag to that reported at Kawanda. Grass mulch depressed nitrate accumulation, but an interesting feature of the Kawanda results has been that despite the lower nitrate under mulch, the mulched plots gave the highest yields of both *Eleusine* and cotton. In this case, however, it is possible that the moisture content of the soil may be a limiting factor and this possibility is being investigated.

There is as yet no standardisation of technique regarding the measurement of soil crumb structure; nevertheless observational work has been carried out at Kawanda and in anticipation of a standard technique which it is expected will be forthcoming shortly, a large replicated trial has been laid down to ascertain the comparative effect of grasses, legumes and root crops on crumb structure.

A series of observations is also being made on the effect which different crops may have on a soil the crumb structure of which has been reduced to "zero". After the crops had been growing on this soil for twelve months the percentage water stable crumbs remaining on the ½ m.m. sieve (as determined by Martin's technique) were as follows:—

Bare soil	10·8	per cent water stable.
Sweet potatoes ...	8·5	crumbs greater than ½ m.m.
Leucaena glauca ...	25·6	" " " " "
Pigeon pea	26·1	" " " " "
Paspalum notatum ...	36·1	" " " " "
Chloris gayana ...	34·6	" " " " "
Sorghum	33·9	" " " " "
Elephant grass ...	36·9	" " " " "
Eleusine	26·8	" " " " "
Groundnuts	19·0	" " " " "

These interesting results are being investigated by a replication of the treatments. The similarity between the figures for the grasses and for sorghum is striking and suggests that it might be profitable to investigate the possibility of substituting for the first year of the three years grass rest, a crop of sorghum which is ratooned for the second rains and seeded down to *Chloris* during the ratoon period.

The large fertility experiment to which reference has been made in previous Annual Reports is now giving clear and consistent results for both the manurial and resting period treatments and applications of manure at the low rates of 2½ tons and 5 tons per acre per rotation are showing striking results.

Animal Husbandry

With any sound farming programme it is essential to link and co-ordinate crop husbandry, pasture management and animal husbandry, since all are inter-dependent. Accordingly the work relating to the integration of livestock into the farming economy of Uganda is undertaken by both the Veterinary and Agricultural Departments working to a common policy and in close collaboration, and in this connection I wish to record the assistance which the Director of Veterinary Services and officers of his Department have given towards implementing this policy.

General land utilisation problems concerning mixed farming and the more specific problems relating to investigational work in connection with animal husbandry and breeding have continued to be brought before the Husbandry Committee, an advisory body which is representative of both the Agricultural and Veterinary Departments, for framing recommendations and passing these to the Department or authority concerned for administrative action.

At all main agricultural stations work connected with livestock breeding, feeding and management was continued and extended, while the results obtained from this investigational work have been passed on to the African farmer mainly through the channels afforded by the organisations connected with the livestock improvement areas. Simultaneously, however, the more basic principles concerning animal husbandry and livestock management are continually brought to the notice of farmers by the executive officers of the Department.

As a result of maintaining as far as possible continuity of policy, which from a breeding point of view has included a degree of line breeding, the Serere herd of cattle is now one of the finest herds of Zebu cattle in Uganda, if not in East Africa. Livestock breeding work is necessarily a slow process and it is not of course possible to show a rapid improvement from year to year, but it is worthy of note that while in 1943 the average daily milk yield per cow was three pounds, that in 1949 was seven and a quarter pounds excluding any milk suckled by calves. During the year under review the highest yielder gave 305 gallons in 274 days in addition to feeding her calf, while some 17 cows and heifers gave more than 200 gallons in their lactations. Although these figures are satisfactory to date, work will be directed to further improvements and there would appear to be no reason why a daily average milk yield of one gallon per cow should not be attained within the next few years.

Attention has also been given to supplementary feeds and feeding and the aim has been to prepare a practical ration consisting of locally produced feed. Such a ration has now been evolved and fed in proportion to milk yield and it has given an overall increase in milk of 30 per cent. which more than pays for the cost of the feed. In addition this ration is well within the means of any enterprising African farmer.

Due consideration is also given to the beef production potentialities of our various types of indigenous cattle and in order to collate data for this and also from general herd management considerations, weigh bridges are being installed at those centres which lack them in order that all stock may be regularly weighed. From such weighings at Serere during the past three years, it has been found that calves in the "Free Range" herd, that is to say an unmilked herd to which low yielding cows have been drafted, have averaged just over 300 lb. liveweight gain per annum, while the average gain for hand-reared calves which are generously fed is in the region of 200 lb. per annum. This indicates that calves from some of our indigenous types of cattle, provided they are suitably fed, are capable of putting on liveweight gains which are relatively comparable with those of European breeds.

Pasture Work

Work on pasture and grassland improvement continued during the year on lines recorded in previous reports, namely to find the best grass or mixture of grasses suitable for a short-term ley, to investigate the management of both seeded leys and natural regeneration from the point of view of building up soil fertility and the production of stock and stock products and to improve the management of permanent grazing on uncultivable land.

Accumulated evidence over a period of years shows that, under conditions of which Serere is typical, a three years period of cultivation followed by three years rest under grass is a system which is fully adequate to maintain fertility. Controlled grazing during the resting period does not reduce subsequent crop yields and indeed may increase them. Trials of numerous species of grasses and their suitability for establishment as temporary leys have been carried out; the criteria for suitable species are ability to restore soil crumb structure, ready production of seed of good viability, quick cover of the land and good bulk, palatability and ease of eradication when the land reverts to crop. The two grasses which to date have shown most promise are *Chloris gayana* and *Bothriochloa glabra* and use of the former among African farmers is being actively encouraged.

In the higher altitudes of Kigezi District such grasses and pasture plants as *Bromus marginatus*, *Melinis minutiflora*, New Zealand wild white clover and perennial rye grass are under trial.

Irrigation

In the Annual Report for 1948 reference was made to investigating the practicability of introducing into Karamoja the Aden methods of irrigation by utilising flood water. In brief this system aims at using flood water from the hill areas for the periodical flooding of enclosed or bunded areas along the fertile river banks in arid to semi-arid regions. During the period under review satisfactory progress has been made by two teams headed by the four skilled Arabs who arrived from Aden towards the end of 1948.

The experiments are being conducted at two centres and consist of the construction of water-retaining bunds by ox-drawn scraper boards with the necessary water gates and channels and the provision of deflectors to protect the banks and bunds from flood damage. While there is nothing intrinsically difficult in constructing the bunds, the siting of the water gates and deflectors requires considerable skill and the success or failure of any individual project depends to a very large degree upon their situation.

Generally speaking the preliminary results show promise, although one of the irrigated areas was totally destroyed in May due to an unprecedented cloud burst on the Moroto mountain which resulted in a catastrophic flood in the Mani-Mani river. Yields of up to 2,000 lb. per acre of sorghum have been obtained while a plot of groundnuts yielded at the rate of 927 lb. of shelled nut per acre. Pigeon pea and tepary beans have promised well.

The investigations are still in the preliminary stage and much information has yet to be acquired, such as to the number of floodings required per crop, the correct depth of water to let on to the land and, perhaps the most important of all, the extent to which the Karamojong themselves can not only learn how to select deflector sites but can also be persuaded to undertake this intensive system of cultivation which entails considerable hard work.

During the year preliminary investigations were made regarding a possible irrigation project on the Lake George Flats, the water for which would be derived from the larger rivers flowing south-easterly from the Ruwenzori range. Initial soil samples have been taken but concrete proposals regarding the project have not yet been formulated.

Agricultural Education

Full use was made of increased accommodation in the new Serere Education Centre, a total of 875 persons attended agricultural courses at this centre during the year. Five Makerere College students did their year's practical course at Serere while eighteen apprentices joined the course of a year's duration which trains men for employment as instructors in the Department. Over four hundred chiefs and peasant farmers and also sixteen women took short courses of instruction. Some one hundred prison warders also attended courses, an indication of the keenness on agriculture which is in evidence at the various African Local Government Prisons in many parts of the Eastern Province. At Serere also there were refresher courses for Assistant Agricultural Officers and Instructors.

Following agreement between the departments concerned as to the teaching of agriculture in schools, the policy which has been adopted is that instruction should be given in the first instance to teaching staff and to teachers in training at Teacher Training Centres. Following this the teachers will be in a position to impart their

knowledge to their pupils at the numerous centres at which they work. To give effect to this policy it is necessary that school and training centre lands should be made into demonstrations of good farming and by the end of the year seventy-one training centres and schools in the Eastern Province were cropping their land in accordance with approved plans.

At Bukalasa courses of instruction were given to Makerere students, apprentices, schoolmasters and cultivators. Five of the latter courses were held, attended by ninety-seven people. Besides actual courses at Bukalasa as much use as possible was made of areas which have been improved by the people themselves under advice from departmental officers. The soil conservation methods at Sayi and Buganga and the good management of cattle by dairymen at Ngogwe and in Kyadondo make a much stronger appeal to African farmers than demonstrations on Government farms, and in Buganda arrangements were made for numerous parties to visit these places.

The Agricultural Officer, Kampala, has devoted much time and attention to the use of films as a means of agricultural propaganda and he assisted the Colonial Film Unit and the Public Relations and Social Welfare Department in the preparation of three films: "The Story of Sayi", "Pamba" and "Coffee Regeneration". This method of extension work is of considerable potential value provided the showing of the films is accompanied by a suitable commentary given by a person who understands the significance of what is being shown. Agricultural shield competitions were held in all districts of Buganda and individual cultivators' competitions were held in Masaka District.

In the Western Province good work has been done by the district staff in Bunyoro District in improving school gardens and the manner of their cultivation, but still more important has been the increased interest taken by both teachers and students in agricultural matters. A short course for seventy women teachers and vernacular teacher training centre students was held at Kabale when the interest shown by those attending was most gratifying.

In the Northern Province shows organised by the African Local Governments were staged at two centres in Lango District and at one centre in Acholi District where agricultural exhibits and demonstrations were well represented.

Monthly agricultural news letters to chiefs issued jointly by the Administration and by the Department are issued regularly in all districts of the Protectorate.

Pests and Diseases

No locusts were present in swarms, but the Red Locust (*Nomadacris septemfasciata*) continued to exist in suitable localities in the solitary phase. Swarms of the Kagera Dwarf Locust (*Faureia milanjica*) increased in number and size in the south-west, where slight damage to grain crops occurred.

The sweet potato caterpillar (*Acraea acerata*) reduced crops of sweet potatoes by defoliating entire fields in many areas of the southern half of the country, the attacks were most severe during the dry weather and dusting trials were made at Kawanda in an endeavour to find a practical means for the control of this pest.

Lygus (*Lygus vosseleri*) caused damage to the cotton crop of about average intensity and as usual the incidence was most severe in the eastern areas of Uganda. The effect of enforcing field sanitation during the close of the season on the number of cotton stainers (*Dysdercus*) and pink bollworm (*Platyedra gossypiella*) was strikingly shown in one of the escarpment cotton areas in Bunyoro, where a severe attack of the previous year was reduced to low proportions during the year under review.

Antestia was locally serious on *Arabica* coffee, but while on Ruwenzori this pest was less serious than in 1948, severe damage was reported from parts of Ankole. On Elgon the main outbreak was still in the higher levels of North Bugishu where it showed signs of lessening in intensity during the year.

Development of Mechanical Cultivation

Increases in agricultural production in Uganda which can be effected through improvements to existing methods of peasant agriculture are subject to certain limitations. Any major increase which can be brought about, however, will result from a higher return per man day worked, which in turn will provide opportunities for a rise in the standard of living of the rural farming community, while at the same time releasing more people for work in industrial and other non-agricultural pursuits.

In farming systems depending on perennial crops, such as coffee, for cash income a higher return per man day worked depends mainly on a higher production per acre through the adoption of better cultural methods, better strains and adequate disease and pest control. This can be supplemented by giving the farmer a greater return by the adoption of better processing methods and by reduced marketing and processing charges. In farming systems based on annual crops, or the combination of annual crops and livestock, farmers in other parts of the world have obtained an increase in production per man by the use of tractors and machinery. Use of machinery should increase production per unit of labour by permitting operations to be carried out quickly at the right time, by opening up the possibilities of using dusts and sprays for insect and disease control, by making applications of manures and fertilisers more feasible and by economising in the use of labour required for farm transport, threshing and grinding. There is, however, little hope of obtaining the full benefits of mechanisation with peasant farming systems as they exist today in Uganda. Reorientation of farm layout is required in order to obtain larger fields on which medium or large tractors can work economically.

These problems are not new and they have had the attention of the Agricultural and other departments for many years. During 1949 it was decided that they were of sufficient importance to warrant the setting up of a section of the department to deal with them and an Assistant Director was appointed in September to devote his whole time to these activities. The scope of the work is indicated below.

Machinery Testing

Few of the machinery problems met with in Uganda are peculiar to this country. In a few cases adaption of machinery to suit local conditions will no doubt be required, but in most cases the problem is rather one of finding out what machinery used in other parts of the world is most suitable for our conditions. The Assistant Director (Special Development) had an opportunity to collect a considerable amount of information of this type as a member of a Mechanical Mission which visited several British territories in Africa in 1948. This tour was followed by visits to manufacturers and universities whilst in England early in 1949, and a short visit to certain southern parts of the United States of America, where crops grown are similar to those of Uganda, in May, 1949. A European Assistant designated for work in this section was sent to the National Institute for Research in Agricultural Engineering at Silsoe, Bedfordshire, for a two months' training course before taking over his new duties, and he also attended a two weeks' course at the Ford Training School at Dagenham.

Testing and modification of implements will require trained staff and facilities in Uganda, which have not yet been obtained. In the meantime a central register has been set up, so that proper records of the perfomance of machinery already owned by Government may be kept. The Empire Cotton Growing Corporation and certain other Government departments are co-operating in this respect.

The main annual crops of Uganda are those of America rather than those of Europe. Suitable machinery can normally be obtained quickly from dollar sources, but supplies from sterling sources are difficult to obtain. British manufacturers and their local agents are interested in our problems and the supply position was better at the end of 1949 than the end of 1948.

Staff Training

The department has been using tractors on experiment farms for two or three years, and some reasonably efficient tractor drivers have been trained. New drivers are being trained by placing them as apprentices with the older drivers. Such apprentice training needs to be supplemented by some more formal instruction, and the Officer-in-Charge, Kawanda, was able to arrange for a few talks to apprentices stationed there; such training cannot be instituted as a regular routine until additional staff is obtained. So far experience in Buganda suggests that schoolboys with some secondary education make more efficient drivers than older men with previous experience as lorry drivers.

Training of agricultural mechanics is a more difficult problem than training of drivers. Commercial firms have co-operated by taking a few of our drivers into their workshops for short periods, which has been useful, but cannot produce fully trained mechanics. The Technical Training Section of the Education Department is now co-operating by sending one of their students for part of his apprenticeship to a commercial firm with tractor workshops; if this is successful this scheme can be expanded.

The main test of the value of machinery in farming systems is one of economics. If the high overhead expenses of employing numerous European accountants and farm managers are to be avoided Africans must be trained to take over many of the managerial posts of development schemes, these posts require knowledge of accountancy, book-keeping and farm management. Few employees of the Agricultural Department have such training, and development schemes will have to be used in the early stages to give them this training.

Farm Management Studies

Experimental farms run by this department have been designed to test the efficiency of specific cultural operations, for breeding and testing of new strains and varieties of crop plants, for soil studies and for insect and disease investigations. Such studies include studies of the effect of different farming systems on maintenance of soil fertility and crop yields. They are not, however, suitable for studies of the economics of farm management.

Demonstration peasant smallholdings have been set up in conjunction with experimental and educational sections of the department at Bukalasa and Serere. It must be said that they have failed to show that a peasant farmer can attain a standard of living which is attractive to the educated African of today. The smallholder probably has a very useful function to fulfil in the agricultural economy of Uganda, as he has in Europe; to attain a reasonable standard of living he must, however, concentrate on specialised intensive systems of farming. Milk production and vegetable production near large towns, production of high value crops such as coffee and bananas on highly fertile soils on a co-operative basis as is done in Masaka are examples.

The study of management on larger units requires special investigations. The development schemes mentioned below cover part of the problem. Careful surveys of existing farming methods and farm organisations will be required. In addition a number of experimental farms designed for management studies will be needed. In 1949 an estate was purchased at Kamenyamigo in Masaka for this purpose, and work on clearing had been started. Additional farms will be started in 1950 in other areas.

Development Schemes in Uninhabited Country

Though country is normally uninhabited because it is not worth inhabiting, Uganda is in the fortunate position of containing

considerable areas of reasonably good land closed through infestation with tsetse fly carrying human trypanosomiasis. Information available today suggests that such areas can be opened up for farming provided sufficient capital is invested to ensure opening up in large blocks. Piecemeal opening by the methods of peasant cultivation, which leave behind numerous blocks of scrub and forest, are not feasible.

Towards the end of 1949 land in the Sleeping Sickness area of South Busoga was chosen for development of this nature. The farm will be run in the first place by paid labour. The initial capital put up for a farm of 5,000 acres is £80,000, of which the Busoga African Local Government will contribute £8,000 and the Protectorate Government £72,000. A board of management has been appointed containing representatives of both the Protectorate and Local Governments.

In addition to its function of acting as a trial development scheme and providing information on farm management under mechanised conditions, this farm is required to produce food in bulk to meet the requirements of the increased labour force anticipated in Jinja through work on the Owen Falls dam and the ancillary industries expected to start there. As this farm is required to produce the maximum amount of food it will be run on a fully mechanized system even though use of hand labour might reduce costs in some cases.

By the end of 1949 a preliminary survey, including laying out of contours for strip cropping, had been completed on one farm of 500 acres. Orders for machinery had been placed, and sufficient has been received to start ploughing during the last week of December. An agricultural officer has been appointed as manager of the farms. Arrangements have been completed for erection of pre-fabricated staff quarters and farm buildings; the farm has been able to make use of an abandoned county headquarters to start with.

The programmes for this farm for 1950 envisages getting one 500-acre farm in full working order during this year, with two additional farms cleared ready for cropping in 1951.

Development Schemes in Settled Areas

The problems of obtaining orderly land use in settled areas are in many ways more difficult than those of empty country. It is necessary to persuade farmers to change the layout of their farms and to agree to a degree of regimentation which is no more popular in Uganda than in other countries. If success can be achieved the possibilities for permanent improvement of agricultural methods are much greater than those provided by schemes in undeveloped areas. The best land, which will give the highest return for capital invested, is already settled in most parts of Uganda. Use of capital for unremunerative activities such as bush clearing, provision of water supplies and provision of roads is avoided. A development scheme in a settled area can also make use of the existing administrative machinery to reduce some of its overhead expenses.

The chances of obtaining land layout suitable for mechanisation are greater in districts with tribal land ownership, such as Teso and Lango, than in Buganda. On the other hand the value of crops produced per acre in these more northern districts is low, the long dry season makes full utilisation of machinery difficult and existing use of ox-drawn implements makes the need for tractor power less urgent. In the case of Teso District there is now little cultivable land unoccupied and no certainty that labour displaced by tractor power would find useful occupation elsewhere. A small mechanised contract scheme has, however, been started in the Pigiri gombolola of Teso District, which is a segregated area for cotton seed increase, and had previously been chosen for a Livestock Improvement Scheme. About 60 acres of land were opened by a tractor in 1949 and arrangements had been made to increase the number of machines available in 1950. Work done in the autumn of 1949 was limited by farmers' lack of cash to pay for it.

The main activities are initially being concentrated in Buganda. Two independent lines of approach are contemplated:—

(*a*) *Large farmer land owners.*—A relatively small number of land owners now farm a sufficient area to justify purchase of tractors for their own use. By the end of 1949 there were six African farmers in Buganda operating their own tractors. The number will probably increase, but not rapidly as they are finding considerable difficulty in obtaining suitable implements and in keeping their machinery in good running order. Two of these farmers were men who had hired government tractors before purchasing their own. Two more have obtained our advice both before and since purchasing. All are considering using their tractors for hire to their neighbours, though they have done very little contract work. In nearly all parts of Buganda there are many farmers who crop ten acres or more under annual crops. Most of these men would hire tractors for all operations which can be done more cheaply by machinery than by hand labour.

Neither of these types of farmer present problems which are not met with in other countries. Use of tractors available at Kawanda during 1949 was mainly limited by lack of staff to supervise them. The rather scattered nature of these larger farmers makes the cost of contract work high, but probably not excessively high, in relation to the value of produce sold for local consumption. The lack at present of suitable weeding, planting and ridging equipment tends to prevent expansion of cultivated acreages.

The main objective of this department in connection with these bigger farmers in the near future must be to make sure that they adopt a system of farming which maintains fertility; many will exhaust their land with little thought to fertility maintenance or prevention of erosion if given the opportunity. They need facilities for training themselves and their sons in farm management and machinery upkeep.

(*b*) *Small Farmers.*—Though there are many farmers in Buganda who rely upon hired labour, the bulk of the land is occupied by farmers who do most of the work themselves and grow not more than three acres of annual crops. Use of machinery on these holdings for growing low value crops such as cotton, maize and groundnuts cannot be economic without some form of co-operation between neighbours.

A contract service scheme has been started in the Ngogwe gombolola, Kyagwe county, with the main objective of finding out whether co-operation between small farmers of this type can be achieved. One pneumatic-tyred Fordson tractor was working in the area during 1948. Early in 1949 one half track Fordson was added, and numbers increased to six tractors during December, 1949. A considerable amount of experience has been obtained, but progress in getting co-operation between small farmers is very slow.

Experiment Stations

A full description of the Department's Experiment Stations was given in the Annual Report for 1948 and to which reference may be made regarding their situation and the type of work carried out at them. This work has continued but during the year a departure has been made from the activities normally carried out at Experiment Stations in that one station, namely Kamenyamigo in Masaka District, has been wholly set aside for purposes of obtaining first hand information regarding the economics of an African farm operated, under approved farming methods, by an African family. Although during past years a considerable amount of information has been collected in connection with the costs of production of native grown crops and the economy of African farming, these figures cannot be regarded as wholly satisfactory since they have in many cases been obtained from smallholdings and other such-like units attached to and at times operated as part of an experiment station. The size of Kamenyamigo and the type of land is typical of many of the larger African "coffee" farms in Masaka District, if not throughout Buganda, and the intention is to allow this farm to be developed and run by an African and his family. He will receive guidance regarding the layout and farming methods, buildings and equipment will be of a standard and on a scale such as could be expected of a progressive farmer. Costs will be kept in as simple a form as possible yet commensurate with that which will give reasonably reliable information. Other farm books and registers will be kept and after a few years' running it is hoped that we shall have a reliable guide concerning the practical experience and economics of an African mixed farm of this particular type.

Insecticides

A most fruitful collaboration has been started with the Colonial Insecticide Research Team and I am indebted to this organisation for their assistance. With part time services of a field officer, Mr. E. T.

Mesmer, and the help of their Chemist, Dr. P. A. Robins, work has started, not only on the practical control of insects of economic importance, but also on such important matters as the absorption of insecticides into plants, residual toxicity of treated crops to man and animals and the persistence of insecticides in the soil. In the past it has not been practicable to use insecticides for the control of pests on peasant-grown crops in Uganda but circumstances which are likely to alter this position are firstly, the discovery of new insecticides, some very persistent, some relatively harmless to human beings and some with systemic effects; secondly, the development of low-volume spraying; thirdly, the possible mechanisation of farming; and fourthly, the various large scale agricultural developments which are being considered.

SECTION II.—FOOD CROPS

General Review

EASTERN PROVINCE

As a corollary to the late arrival of the spring rains both the planting and harvesting of food crops were delayed and the period when the population had to resort to famine reserve root crops was necessarily prolonged. These reserves were insufficient in Mbale District and parts of Busoga and it was necessary to supplement local foods with imported maize meal which was sold through the normal retail channels. Teso District on the other hand was able to tide itself over to the harvest from the spring sown crops without having to import food. This was due partly to storage of grain but more particularly to strict early planting of cassava in 1948 which matured in the second quarter of 1949. Throughout the Province there was a heavy loss of sweet potato vines due to the prolonged dry season, consequently the planting of the new crop was seriously delayed since this had to await the production of shoots from dormant tubers. Lack of rain made repeated sowing of the finger millet crop necessary and reduced the yields of the main crop which were below average. Banana gardens also suffered severely from the drought and yields were meagre until the latter half of the year. The food shortage was not really over until August and at that time the prospects for 1950 were poor as insufficient planting weather had been received to enable growers to compensate with high root crop acreages for deficiencies in grain. A very firm campaign, backed by the authority of the Native Authority Ordinance, was launched for root-crop planting as soon as cotton planting was well advanced. Special encouragement was given to building up a reserve of dried sweet potatoes as a famine reserve. Large acreages were planted in September and early October, partly on swamp fringes with thorn surrounds, to provide both food and planting material. The onset of dry weather in October and November

endangered the crop and there was general relief when abnormally heavy rains occurred in December. The root crops obtained a good hold and made excellent growth, banana gardens came into good bearing, catch crops were planted in the swamps and a number of rice plots were prepared and planted.

Good progress was made with the introduction of varieties of cassava resistant to mosaic disease. One administrative area in each district was selected and, after uprooting and destroying the old susceptible and heavily infected types, cuttings of mosaic-resistant varieties from multiplication centres were issued for planting. This complete replacement system is preferable to the haphazard method of issuing mosaic-resistant planting material to scattered areas and the system will be extended year by year until all districts have been completely flushed with the improved cassavas. In Teso District it was estimated that over 8,300 acres of mosaic-resistant varieties were planted.

Northern Province

Despite the late rains and the subsequent late planting of food crops there was no great food shortage. As far as is known no granary reserves of millet were called upon and any minor shortages were supplied locally. Conditions for the grain crops were not ideal and yields generally were below average, but on account of the additional land made available by increased cotton production, acreages in many instances were above average and total production in 1949 should suffice provided rainfall conditions early in 1950 are reasonably normal. The acreage of finger millet, for instance, was increased considerably and it was estimated that some 342,400 acres were planted compared with 280,500 acres in the previous year. Germination of this crop was, generally speaking, good but subsequently weather conditions were not favourable to ideal growth and the yields suffered accordingly.

In Lango and Acholi, where the main increase in the millet acreages took place, there was a tendency to complacency and cultivators neglected new plantings of cassava. In the West Nile District on the other hand the position was reversed and a satisfactory acreage of cassava was planted in September after cotton planting had ceased. The distribution of mosaic-resistant varieties from increase centres continued.

Western Province

Although there were localised shortages of food, the situation generally throughout the district was satisfactory and apart from the importation of food for estate labour in Toro District it was not necessary to supplement supplies elsewhere from external sources. It was fortunate that the harvest from the 1948 autumn planted crops was large as this gave considerable relief until food became available from the spring crops of 1949 which were planted late on account of

lack of rain. In the densely populated areas of Kabale and South-West Kigezi local food shortages occurred, but it may be stated with confidence that these would have been serious had those areas not been so excellently protected against soil erosion and had some 10,000 people not migrated to the Resettlement area.

Owing to adverse climatic conditions the harvest from the spring planted food crops was below average but rainfall during the second half of the year was adequate and the autumn plantings yielded well.

It was unfortunate that in some areas of Toro District people neglected to maintain adequate reserves of root crops, such as cassava. This was doubtless due to their enthusiasm towards the production of remunerative economic crops such as cotton. During the autumn rains, however, a campaign was instituted to bring the cassava acreage to a safe level.

Buganda Province

The drought from mid-November, 1948, until April, 1949, had adverse effects on the food position throughout Buganda and reduced very considerably the yields from bananas, cassava and sweet potatoes.

The food position began to deteriorate in March; by the end of May the position was serious in many parts of the Province and the difficulties were accentuated by the civil disturbances already mentioned. Until the spring planted crops were available for consumption it was necessary to import considerable quantities of maize meal from Kenya to give relief to many areas, but conditions improved during the latter part of June and in July when green maize became available. There was a gradual decline in the production of bananas, which became very marked from August onwards, by which time exports from Masaka to Kampala had become reduced to a few loads per day.

Large acreages of beans were planted as soon as weather conditions permitted and this crop, harvested and eaten green, did a great deal to supplement food supplies and improve the diet generally.

Cassava is stated to have been eaten in larger quantities than ever before in Buganda and by October all available supplies had been exhausted in Masaka and there was little left in reserve elsewhere. It was unfortunate also that unfavourable climatic conditions appeared to increase the incidence of mosaic, but every endeavour was made to make the maximum use of planting material of resistant varieties. Sweet potatoes suffered heavily in Mengo from damage by caterpillars and remained in short supply throughout the year. Banana gardens were slow to recover from the effects of the drought and poor cultivation coupled with the attacks of banana weevil prevented this crop from producing its share of the Buganda food supply.

With the exception of Bulemezi and parts of Mubende, where there was too great a concentration on the growing of cash crops, cultivators realised the seriousness of the food position and took advantage of every favourable opportunity to augment future supplies.

Good progress in planting all food crops was made from July to October, and the heavy rains of December were extremely beneficial. At the end of the year the food position was reasonably secure in all parts of Buganda except Buruli, Buwekula and the three western counties of Masaka where rainfall was particularly low.

Food Crops—Investigational

General

Work in connection with the production of heavier yielding, earlier maturing and disease-resistant varieties of food crops has continued and particular attention has been paid to cassava and maize. It is particularly important that an early maturing and good yielding type of maize should be produced in order that it can be harvested before the main cotton planting season commences. Good headway has been made and indications are that at least one selection may prove to meet our requirements.

If it is ultimately shown that the mechanical cultivation of African grown crops will be economically successful it will follow that we must endeavour to harvest by mechanical means as many types of crops as possible. This will be particularly relevant to grain crops such as finger millet and sorghum and accordingly consideration has been given to the production of types of these which can be harvested by mechanical means. For instance many of our existing varieties of sorghums are too tall and cumbersome to be handled efficiently by combine harvesters and the production of suitable dwarf varieties or strains will be necessary.

Crop Storage

Complaints that maize could not be stored satisfactorily in the heavy rainfall areas of Toro District were investigated and storage trials were instituted. It was found that an admixture of diatomite with bagged grain protected the maize from insects and heating for a period longer than the six months required by the employers of estate labour even when exposed to severe infestation in one of the wetter and cooler parts of the district.

SECTION III.—ECONOMIC CROPS

Cotton

General

The 1948–49 crop amounted to 392,000 bales, the second largest crop ever produced in Uganda. Comparative acreage and production statistics are detailed in Appendix I (*a*) and the following table gives a comparative picture over the past eight seasons:—

COTTON PRODUCTION—UGANDA: 1941–1949

Season	Estimated Acreage	Tons of Seed Cotton	Average Yield per Acre	Average Price per 100 lb.
			lb.	*Shs. cts.*
1941–42	1,287,256	140,697	245	7 68
1942–43	874,776	67,416	173	12 56
1943–44	1,233,801	112,011	203	13 18
1944–45	1,072,493	160,830	337	14 83
1945–46	1,145,568	135,525	265	16 40
1946–47	1,253,257	138,457	247	18 45
1947–48	1,036,829	101,113	218	20 42
1948–49	1,555,371	231,472	333	29 61

The F.O.B. Mombasa value of the lint from the 1948–49 crop amounted to £17,342,765 compared with £7,457,617 in the previous season.

It will be seen from the above that the campaign for increased agricultural production, in particular cotton, which was initiated in 1948 proved successful, total acreage being increased by over half-a-million acres while, in comparison with the previous season, production was more than doubled.

The crop was disposed of overseas partly by bulk contracts and partly by auction locally for free export. Under bulk contracts some 200,000 bales were shipped to India and 100,000 bales to the United Kingdom, while approximately 100,000 bales were sold in auction. Prices realised varied from 25 to 28 pence per pound F.O.B. Mombasa. Prices to growers were increased by Shs. 8 per 100 lb. of seed cotton bringing the price to Shs. 30 per 100 lb. for the variety B.P.52.

In regard to the 1949–50 crop a satisfactory acreage was planted, totalling 1,628,518 acres. Unfortunately weather conditions during the optimum planting months were unfavourable and hence too high a proportion of the crop was late planted. Hence despite the large acreage the crop estimate at the end of the year could not be placed at a figure higher than 320,000 bales. The system of a bonus payment to each local authority at the rate of Shs. 1/20 per 100 lb. of seed cotton on all cotton marketed in the various districts had the effect of stimulating interest by such local authorities in cotton production. Probably the greatest stimulus, however, was the announcement of a guaranteed price before planting commenced made possible by the existence of the Cotton Price Assistance Fund.

COTTON SEED DISTRIBUTION

In Buganda the whole of the seed stocks in the Masaka District were replaced in 1949 with seed of the variety B.P.52 from the Bugerere segregated area. This movement was a corollary to a similar replacement made in 1948 to ensure the complete elimination of the

old type seed from this district. In the same Province other large-scale movements of seed were carried out, all seed in the Mengo–Entebbe zone, except North Kyagwe, being replaced by purer B.P.52 seed from the segregated areas of Bugerere and East Kyagwe, raising the apparent purity of B.P.52 from 70 to 85 per cent., while the Mubende–Toro zone was supplied with fresh seed of the same variety from the West Nile District.

In the Eastern Province there were no major changes in the varieties of cotton grown in the various districts, N.17 being grown in Busoga District and in the South Teso zone, B.P.52 in the Central zones, and B.181 in North Teso and Usuku. The variety S.47 (formerly known as S.5302) was planted throughout the whole of the Teso segregated areas with a view to district distribution in 1950. In the Western Province fresh B.P.52 seed from the West Nile District was introduced throughout Bunyoro District except in the Kyangwali segregated area and the Lake Albert escarpment areas of Biseruka and Kabale where the variety B.C.66 was grown. In the Northern Province the Obongi segregated area in the West Nile District and East Madi were planted with the variety S.47 and this variety will gradually replace B.P.52 in the West Nile District as seed stocks become available.

Cotton Investigational Work

In last year's report it was stated that rainfall in February (that is a close season which is wet from the outset) was believed to assist in the early rotting down of Blackarm infected debris from the previous crop. The close season this year was somewhat dry, and it was demonstrated by experiment that the presence of well-preserved debris does increase the amount of Blackarm damage in the subsequent crop. This is an important advance in our knowledge, because it has been assumed hitherto that the carry-over of Blackarm in the field is not important in Uganda, where a rainy season is interposed between successive cotton crops.

It was also stated in last year's report that when the weather is favourable, and the Blackarm epidemic is in check, the yield in certain areas is more than doubled. In the area where the investigational work has been mostly carried out, both Blackarm and the capsid *Lygus vosseleri*, are major afflictions of cotton. It is therefore difficult to see how a bumper crop ensues when Blackarm is in check, unless the same sequence of weather also checks *Lygus*. The author of the survey of climate and disease points out that, although precise records of *Lygus* infestations are not available, his personal recollection of the bumper years leads him to believe that both Blackarm and *Lygus* were in check. In fact he first attributed the effect to the absence of *Lygus*, and ascribed this to the early planting of millets (and consequent early harvesting, thus breaking the migration) when there is an early onset of the first rains.

It is clearly important to disentangle the effects of Blackarm and *Lygus*, and the current programme is much occupied with this problem. At first sight the indications at Serere this season have not been reassuring. Treatment against Blackarm added less than 10 per cent. to yield, whereas treatment against *Lygus* added 67 per cent., and treatment against both doubled the crop. But the work has been done on the experiment farm at Serere in Teso District, where, for what reason we do not know, *Lygus* infestations are abnormally severe. In peasant agriculture, and especially away from Teso District, the damage done by *Lygus* is much less, and treatment against Blackarm has a much better chance of showing its worth. This aspect of the problem is to be closely studied in the coming season.

In the meantime we have dressed 800 tons of seed in Teso District with cuprous oxide powder (Perenox) as a disinfectant against Blackarm and a further 200 tons of seed near Kampala. The intention is to see in each area whether the disinfection of seed through a considerable stretch of country has any visible effect in practice. There are very strong reasons for making such a test at an early stage. The conditions of peasant agriculture are very different from those on a large farm and as we have seen the *Lygus* situation may make all the difference. Furthermore the spread of a Blackarm epidemic may be such that there would be a limited prospect of success unless the test took the form of a clean-up over a wide area, possibly for several seasons in succession.

The detailed work on seed disinfection has made considerable progress with the assistance of Imperial Chemical Industries Limited. The organic compounds of mercury are the most effective, but they are so dangerous in the hands of a primitive people that it has been necessary to make a start with the less potent, but still effective, copper compounds. The search continues for a safe compound with a strong specific action against the bacterium.

The seed dressing process has been carried out with standard Robinson seed dressing machines slightly adapted for the purpose. Only de-linted seed can be used, and the wide application of the process with this type of machine presupposes a considerable industry in de-linting.

The effects of de-linting itself have also been studied. A normal sample of seed contains only about one seed in ten which is infected. The de-linting process removes the fuzz and presumably a proportion of the bacteria from the seed. But the process involves considerable agitation and stirring of the seed, with the result that the infection becomes spread more evenly, and more than one seed in ten is infected. This does not matter, however, if the seed is chemically treated afterwards. De-linted seed is much quicker and easier to sow, and germinates much better, particularly when the soil moisture available is marginal for germination.

Work on resistance to *Verticillium* wilt disease made good progress, and some valuable sorting of strains was achieved. This work is recognized to be empirical only, but once more there is every indication that resistance is inherited simply, and that its transference to the B.P.50 (S.47) family is proceeding satisfactorily.

Coffee

Buganda Province

The year was not a good one for coffee, the heavy crop of 1948 subjected the trees to a considerable strain and the prolonged dry season, followed by sparse and erratic rainfall during part of the rest of the year adversely affected crop prospects. An increase in the price payable to producers of four cents per pound of clean coffee was made in November; this, with previous price increases, has stimulated more interest in the crop and, during the year, considerable areas of derelict coffee were reclaimed. Some 230,000 seedlings were sold from the coffee nurseries and at the end of the year the estimated acreage of *Robusta* coffee in the Province was 147,096 acres. It must be said that, despite certain improvements which have been effected in methods of preparation and drying, the general standard of cultivation of the crop leaves much to be desired, a fact which is evidenced by the very low average yield per acre of approximately 200 lb. In some areas, however, improved standards have been adopted usually by individual cultivators or by groups of growers who have found it worth while to adopt better cultural practices. During the past dry year those growers who have taken steps to conserve rainfall by constructing *Paspalum* bunds have reaped their reward and there is a striking difference between the coffee on bunded plots and trees on unprotected slopes which are still all too common.

The following table shows the amount of coffee of all grades which passed through curing works during the years 1942 to 1949:—

Buganda Province

Native Coffee Production

(Tons)

	1942	1943	1944	1945	1946	1947	1948	1949
Cured Coffee ...	16,099	17,717	11,856	16,085	24,449	17,238	31,142	18,351

The value of the crop to growers was estimated to total £847,340.

Western Province

Coffee, both *Arabica* and *Robusta*, is grown to a limited extent in both Toro and Ankole Districts. Sales during the year were small amounting to 129 tons of *Arabica* and 308 tons of *Robusta*, the latter being mainly produced in the Bwamba county of Toro District.

Sales of seedlings from nurseries totalled 460,000 plants mainly in Ankole District.

Eastern Province

Bugishu Arabica.—The rising prices for coffee stimulated growers' interest in the crop but it cannot be said that there was any marked improvement in crop husbandry. Demand for seedlings was great and over 1,300,000 were sold from coffee nurseries plus some 126,000 issued free under the coffee replacement scheme.

The 1948–49 season yielded a normal crop of 2,857 tons of parchment of which 937 tons were prepared by the Bugishu Coffee Scheme organisation and the balance was native-prepared parchment. Prices paid to growers were 12 to 13 cents per pound for cherry and 50 to 54 cents per pound for parchment, depending on grade.

The total value of the crop to growers in 1949 was £173,799 as compared with £121,692 in 1948. Comparative figures of production and values for the past eight seasons are as follows:—

Bugishu Arabica Coffee

Quantities Marketed and Values to the Grower

Season	Parchment	Estimated Value
	Tons	£
1941–42 ...	3,004	79,256
1942–43 ...	2,264	55,861
1943–44 ...	3,679	105,592
1944–45 ...	2,705	73,740
1945–46 ...	2,817	97,169
1946–47 ...	3,058	107,215
1947–48 ...	2,996	121,692
1948–49 ...	2,857	173,799

In regard to the 1949–50 season the main flowering was delayed owing to dry weather in the early months of the year, but by the end of the year a crop 2,700 tons of parchment was expected of which 1,820 tons had been purchased by the end of December. Prices to growers were further advanced to 13 to 14 cents per pound for cherry and to 55 to 60 cents for parchment.

Eastern Province

Busoga Robusta.—Interest in this crop by the Basoga continued to be slight. The crop amounted to 24 tons which was purchased by a local African company.

Coffee Investigational Work

Experimental work on coffee was again devoted towards obtaining higher yields by investigating problems connected with husbandry methods and pest and disease control and by selection and breeding for heavier producing trees. At Kawanda an experiment on the effect of removing all dry cherries from coffee plots at the end of the season, in other words of good picking and crop sanitation, failed to give the

expected result regarding the control of Coffee Berry Borer (*Stephanoderes Hampei*). The high infestation of Berry Borer of the previous year became heavily reduced in treated and untreated plots alike, probably owing to the parasites, which had become abundant at the end of the previous season. The internal parasitic insect, *Corioxenos antestiae*, now shows some signs of controlling *Antestia* in the area to which it was introduced on Mt. Elgon, and further movements of parasitised bugs on Elgon and to Kyembogo Farm in Toro have succeeded in spreading the parasite further.

Tobacco

Fire-cured

Although the policy in Bunyoro District has been to increase production, adverse weather conditions coupled with competition from cotton made it difficult to achieve results. Acreage planted amounted to 3,972 compared with 6,928 acres in 1948 and the total crop was 1,582,932 pounds of cured leaf compared with 2,470,000 pounds in the previous season.

In Mubende District tobacco cultivation was extended in Buyaga and Bugangadzi counties, the acreage being increased from 668 acres in 1948 to 1,269 acres in 1949 planted by 4,252 registered growers. Quality of the leaf was satisfactory and a total of 713,610 pounds of cured leaf was marketed. Arrangements were made for further extensions in 1950.

Flue-cured

Production, which is at present on a small scale, is confined to the West Nile and Acholi Districts. In the former 145 acres were planted, producing 54,715 pounds of cured leaf; in the latter 78,000 pounds of cured leaf were marketed from 292 acres.

Air-cured

In the West Nile District the acreage planted—823—was about double that of the previous year. Purchases amounted to 255,789 pounds of cured leaf.

Nicotine Tobacco

In Kigezi and Ankole Districts the usual two crops were grown with a total acreage of 2,957 (1948: 2,765 acres). Production totalled 1,684,612 pounds valued at £10,108.

Damage by root-rot eelworm to tobacco in Bunyoro is unfortunately on the increase, the effect of the pest depends very much on the general health of the plants and the best remedy at present possible is good crop husbandry. Eelworm has been proved to persist for a number of years in the natural vegetation and in elephant grass leys, doubtless owing to the abundant weeds which are always present. Rhodes grass leys show some promise of smothering out susceptible weeds and a rotation experiment to test this point has been designed. A trial of D.D. soil fumigant proved ineffective.

Oilseeds

Groundnuts

In the established groundnut producing areas and where the main crop is derived from the spring plantings, there was a general reduction in acreage due mainly to the late onset of the rains. Planting was delayed and owing to the food shortage previously mentioned many cultivators consumed a portion of the seed supplies which they had reserved from the previous crop. In order to reduce erosion risks encouragement was given in the Busoga and Mengo Districts to intercropping maize with groundnuts, while in Mba'e District the interplanting of cassava with groundnuts was advocated.

The total acreage planted in the Eastern Province was 153,182 acres which was less than three-quarters of the 1948 figure. In Teso, owing to reduced seed supplies, cultivators planted the crop thinly; this resulted in a high incidence of rosette disease and a consequent reduction in yield. The marketing period in both Teso and Mbale was restricted to prevent over-selling so as to conserve food and encourage growers to retain adequate supplies of seed for their 1950 plantings. Sales amounted to 4,855 tons in Busoga, 607 tons in Teso and 494 tons in Mbale District, making a total of 5,956 tons of kernels as compared with 8,484 tons in 1948.

In the Northern Province efforts were made to extend the acreage under this crop and although in many cases reserve seed was ultimately eaten, the total area planted was 60,838 acres compared with 48,734 acres in 1948. The marketable surplus of groundnuts from the Northern Province is negligible and production is consumed locally.

In Ankole the cultivation of groundnuts as a cash crop is increasing satisfactorily. In this district two crops are grown per year, that is to say during both the spring and autumn rains, and the crop is fast becoming an integral part of the farming economy of the district. The 1948 autumn planted crop was harvested in the early months of 1949 and from which 1,121 tons of shelled nuts were marketed. The crop planted in the spring of 1949 suffered severely from drought and only 187 tons were sold, but the autumn planted crop, which is much larger than any hitherto grown, is most promising and indications are that a record harvest will be obtained.

Groundnuts are mainly regarded as a food crop in Buganda but during 1949 there was a substantial increase in acreage and sales rose from 352 tons in 1948 to 1,321 tons in 1949.

Simsim

The growing of this crop is confined to the Northern areas of the Protectorate and even here it is a crop of minor importance due mainly to the fact that, in relation to other crops, costs of production are high. Some 290 tons only were marketed.

Shea Butter Nuts

The marketing of this crop was decontrolled during the year and prices found their own level. These varied from seventeen to twenty-five cents per pound, as compared with fifteen cents in 1948, and the total quantity marketed from the Eastern and Northern Provinces was 1,827 tons (1948: 533 tons).

Castor Seed

As with shea butter nuts this crop is not cultivated as such and collection of the seed is made from bushes or trees growing in what is tantamount to a wild state. Sales showed an increase from 214 tons in 1948 to 672 tons in 1949, most of this was due to a higher production in Masaka District. The risk of other crops becoming contaminated with castor seed was referred to in the 1948 Report and during the year under review endeavours have been made to control this by stringent inspection of produce at markets and by the special marking of bags of castor seed for export.

Cotton Seed

The production of cotton seed from the 1948/49 crop was the second largest on record, and amounted to some 142,000 tons which were utilised as follows:—

	Tons
Local crushing	58,282
Reserved for planting	19,037
Fuel supplies	4,278
Exports to the United Kingdom ...	58,868
Uganda cattle feed	196
Manuring	1,678

Miscellaneous Oil Seeds

Some interest is being shown overseas regarding Candlenut oil but it appears that a satisfactory method of decorticating this nut, which is contained in an extremely hard and thick shell, has not yet been perfected. The Candlenut tree grows very well in many parts of Uganda and during the year a very satisfactory sample of oil, approaching linseed oil in quality, was produced at Kawanda. In anticipation of any developments which may occur the opportunity is being taken to investigate the possibility of growing the tree as shade for coffee.

Experiments with different varieties of sunflowers and linseed were continued and as regards the former crop an attempt is being made to introduce this into the higher areas of the Protectorate, which are unsuitable for groundnuts, not primarily as a cash crop but as an oilseed for local domestic consumption.

Grain Crops

Maize

Although it was hoped that the growing of maize on a relatively large scale would be a temporary war-time expedient to assist the general food supply of East Africa on which heavy demands were

placed during the period of hostilities, it must now be accepted that maize production, in suitable areas of the Protectorate, has become a permanent feature. Maize meal is rapidly becoming a staple article of diet and the increasing labour force of the Protectorate has done much to popularise its use. In addition cultivators find it an easily grown remunerative cash crop.

Steps are being taken to avoid the dangers likely to arise from excessive maize cultivation, for instance organised marketing is restricted to those areas which produce satisfactory yields per acre, thereby limiting the "cash crop" aspect to the most suitable regions. Further, in order to prevent soil deterioration a six-course rotation, embodying a three-year resting period, is particularly advocated and in regard to the maize crop itself, a wide spacing with groundnuts or beans interplanted is being encouraged.

The acreage planted to maize in the Eastern and Buganda Provinces was slightly greater than that of the previous year and despite the fact that the planting season was delayed and that consumption of green cobs was heavy, the marketable surplus was surprisingly high. Sales in Buganda amounted to 448,329 bags of which 288,358 bags were exported to the East African Cereals Pool. In the Eastern Province the price was increased to Shs. 10 per 200 lb. to bring it into line with that paid in Buganda and a strenuous effort was made by inspection at markets and stores to improve the quality. The marketable surplus in Busoga and Mbale Districts totalled 64,171 bags all of which was gristed in the Province for local consumption. The Western Province marketed some 6,303 bags which were utilised by the mines and estates in Kigezi, Ankole and Toro. The total quantity of maize marketed in the Protectorate was, therefore, 518,803 bags as compared with 538,736 bags in 1948.

Rice

The severe dry season delayed the waterlogging of the swamps and consequently there was a considerable reduction in the area of swamp land suitable for rice growing. In the Eastern Province the estimated acreage was approximately 26,000 acres, whereas the mean acreage for the years 1944 to 1948 was almost 40,000 acres. Recorded sales from this Province totalled 146 tons of paddy only, but it is known that a considerable tonnage was sold through irregular channels at prices considerably in excess of the controlled prices.

At Bwamba, in Toro District, the acreage planted was 1,025 acres which was 641 acres less than the 1948 crop. Sales amounted to 134 tons of paddy and 13 tons of hand-hulled rice.

Protectorate prices for paddy were advanced by two cents per pound at the beginning of the marketing season.

Millets

The establishment of the finger millet crop was particularly difficult owing to adverse weather conditions during the planting season and a large acreage had to be resown. Yields were generally

below average but the total harvest was satisfactory. Although 1,186,269 acres of finger millet and 458,106 acres of sorghum were planted only negligible quantities were marketed since these are the main staple food and beer brewing crops. Recorded sales were 250 tons only.

Wheat

Small amounts of wheat were grown in Toro and Kigezi and also at Bukwa on the slopes of Mount Elgon. The acreage was, however, insignificant and the bulk of the crop was consumed in the areas in which it was grown.

Pulses

Beans

Buganda Province continued to be the main producing area and here the acreage was increased considerably. The shortage of bananas, sweet potatoes, and cassava in the early months of the year stimulated people into planting this quick-maturing crop at every possible opportunity and large quantities were consumed in the green bean stage. Indeed it is safe to say that this crop gave a large measure of relief during the period of food shortage and without it the position would have undoubtedly been much more serious. The quantity marketed in Buganda as mixed beans was 4,117 tons as against 1,214 tons in 1948. Sales in the Kigezi, Ankole and Toro Districts of the Western Province amounted to 106 tons only but an endeavour is being made to stimulate production in these areas in order to meet the expanding requirements for labour employed on the mines and on the tea and coffee estates.

Soya Beans

While this crop regained a certain amount of popularity in Masaka, interest is waning in Ankole mainly because growers consider that a greater return can be obtained from groundnuts. During the year under review a total of 3,127 tons were marketed of which 2,584 tons came from Mengo District. The bulk of the marketable surplus was exported to the United Kingdom Ministry of Food.

Field Peas

This crop is one of the staple foods in Kigezi and Ankole Districts, the only districts in the Protectorate which grow peas to any marked degree and owing to local food shortages sales were restricted. These were recorded as 90 tons but it is known that considerable leakages occurred.

Grams

The policy regarding this crop is to aim at producing sufficient only for the internal requirements of the country. However, in 1947 a sudden demand overseas led local merchants to offer high prices and to encourage an increased production. The result was a very considerable extension of acreage under this crop in 1948, but by the time that crop was ready for marketing the export price had fallen

and producer prices fell accordingly. This drop in price was reflected in the 1949 acreage in Buganda which fell to a more rational 9,191 acres compared with 44,043 acres in 1948.

Miscellaneous Crops

Flax

This industry again suffered from setbacks during the year. The spring planted crop suffered first from adverse weather conditions and later in the season *Pasmo* disease reappeared and seriously affected the quality of the straw. In an attempt to control this fungoid disease all seed issued for autumn planting was dressed with Agrosan and from a field sanitation point of view plantings took place in fields which had not hitherto been planted with flax. This autumn planted crop grew well and showed considerable promise until shortly before it came to maturity when a rapid and widespread infection of *Pasmo* occurred thereby reducing very considerably the quality of what would otherwise have been good straw.

The harvests from the 1948 autumn planted crop and the 1949 spring planted crop amounted to 896 tons of straw and 165 tons of seed which gave a most disappointing average of 860 lb. of straw and 159 lb. of seed per acre.

The Kisizi factory was closed for scutching during the dry month of July but was in operation during the remainder of the year. Production of fibre and tow was as follows:—

	Tons
Fibre	36·60
Tow	27·03
Tow waste ...	8·20

Chillies

Under the stimulus of high prices there was some revival of interest in this crop with a considerable increase in the recorded acreage. Growers, however, have generally speaking not forgotten the slump of 1947 and there is no reason to anticipate a vast increase in production such as took place during 1946.

In collaboration with the Department of Agriculture, Kenya, and for purposes of improving the quality of our chillies, the Government of Kenya introduced Chillie Grading Rules during the year. These Rules provide for the inspection and grading of chillies at Mombasa prior to export.

Wattle Bark

Wattle trees have been planted in the past, in parts of Kigezi and Ankole, primarily for a domestic fuel supply. Owing to distance from railhead world prices in the past for wattle extract and chopped bark have been such as to preclude the development in those areas of a wattle industry. During the year, however, owing to the high prices for bark offered by India, local traders became interested in obtaining supplies for export and purchased approximately 1,000

tons of bark at 4½ cents per pound. Competition to obtain this produce was such as to result in a chaotic and indiscriminate cutting of trees and to an extent which made it necessary to place a ban on exports of bark until such time as the situation could be examined and a rational tree cutting and bark marketing system evolved.

European Potatoes

Only in Kigezi has this crop been grown on a substantial scale. The acreage in this district increased from 3,556 acres in 1948 to 5,429 in 1949 and some 450 tons of potatoes were marketed, most of which were consigned for resale in Kampala. Late blight (*Phytophthora infestans*) causes some damage and trials are in progress with varieties which are reputed to be resistant to this disease.

Onions

This crop continues to be grown in parts of Toro, Ankole and Kigezi where the acreage is steadily increasing. During the year a total of 330 tons were sold to Kampala.

Staff

It must be recorded that a great deal of the time of both the head office staff and of the field staff of the Department is taken up with work connected with the organisation of the marketing of the various crops produced in the Protectorate. This work, necessary as it is, inevitably reduces the amount of time and effort which can be devoted to problems associated with agricultural development; this report in the main deals with the more strictly agricultural aspects of the work of the department and does not attempt to describe the multifarious activities connected with the arrangements which it is necessary to make for the marketing and disposal of the principal economic crops.

There was some improvement in the staff position during 1949, one Chemist, one Botanist, two Agricultural Officers, one Ginning Inspector and four European Agricultural Assistants were recruited. The Department, however, suffered the loss, through retirement, of the Assistant Director and one Senior Agricultural Officer and with further retirements of senior officers likely to occur in the near future the position is still not entirely satisfactory.

Mention is made of the sterling work of the Uganda Loading Committee which, in collaboration with the Railway Administration, has done much, despite great difficulties due to shortage of railway rolling stock, to arrange for the orderly and expeditious evacuation from Uganda of the cotton, cotton seed, coffee and maize crops.

In conclusion I record, with grateful thanks, the loyal co-operation and the hard work which has been evidenced by all members of the Department throughout the year.

A. B. KILLICK,
Director of Agriculture.

June, 1950.

Cotton Production 1948–49 Season

Province and Zone	Acreages		Sales in Tons		Yields per Acre in lb.	
	Totals 1948–49	Means 1943–49	Totals 1948–49	Means 1943–49	1948–49	Means 1943–49
BUGANDA—						
Mengo	363,908	292,491	82,704	51,191	509	393
Masaka	42,859	37,770	10,706	5,691	559	322
Mubende–Toro	86,440	63,713	15,461	9,757	400	354
TOTALS ...	493,207	393,974	108,871	66,639	494*	379
EASTERN—						
Busoga	242,248	232,040	47,296	24,891	437	245
North Central	172,079	118,887	14,527	10,432	189	195
South Central	168,330	103,039	13,830	7,129	184	155
Usuku	18,439	16,983	1,359	943	165	132
North Teso	58,614	40,385	3,711	1,504	140	85
South Teso	70,290	51,482	4,316	3,644	134	161
Segregated Areas	37,826	31,054	3,509	2,107	207	151
TOTALS ...	767,826	593,870	88,548	50,650	258*	191
WESTERN—						
Bunyoro	27,376	18,817	3,353	2,208	274*	266
NORTHERN—						
North Lango	117,777	73,140	12,732	7,260	242	221
South Lango	48,013	36,253	4,354	2,388	203	143
West Acholi	37,858	25,090	4,197	2,514	248	229
East Acholi: Lower	7,780	7,685	7,486	780	428	227
East Acholi: Upper	21,716	15,295	2,980	1,440	307	209
West Nile—Madi	33,818	23,579	4,951	2,580	328	242
TOTALS ...	266,962	181,042	30,700	16,962	257*	209
PROTECTORATE TOTALS ...	1,555,371	1,187,703	231,472	136,459	333*	257

* Means

Cotton Production 1949–50 Season

Monthly Plantings—Acres

Province and Zone	April	May	June	July	August	September	TOTALS
BUGANDA—							
Mengo–Entebbe ...	...	1,053	75,725	167,364	148,742	8,199	401,083
Masaka	59	1,693	16,569	22,665	12,116	6,116	59,218
Mubende–Toro	...	1,209	10,081	34,456	34,402	6,495	86,643
TOTALS ...	59	3,955	102,375	224,485	195,260	20,810	546,944
EASTERN—							
Busoga	...	19,423	55,171	93,958	54,155	2,131	224,838
South Central	...	407	34,534	77,931	44,365	3,073	160,310
North Central	226	3,150	21,786	82,422	59,754	861	168,199
North Teso	35	4,011	11,717	19,121	6,520	...	41,404
Usuku	1,137	7,937	3,608	1,544	56	...	14,282
South Teso	668	6,262	15,247	20,993	14,402	97	57,669
Segregated Areas ...	6	1,907	6,474	9,946	10,353	63	28,749
TOTALS ...	2,072	43,097	148,537	305,915	189,605	6,225	695,451
WESTERN—							
Bunyoro	...	63	2,712	11,450	7,655	500	22,380
NORTHERN—							
North Lango	41	3,279	52,543	93,043	24,372	...	173,278
South Lango	...	589	7,256	31,089	16,548	...	55,482
West Acholi	...	605	10,537	19,624	6,346	156	37,268
Acholi: East Upper ...	...	30	5,779	10,232	6,268	493	22,802
Acholi: East Lower ...	...	114	1,954	9,401	3,058	569	15,096
West Nile—Madi ...	...	...	3,772	34,894	15,909	5,242	59,817
TOTALS ...	41	4,617	81,841	198,283	72,501	6,460	363,743
PROTECTORATE TOTALS	2,172	51,732	335,465	749,133	465,021	33,995	1,628,518

Crop Production

Estimated Acreages under Crops—1948 and 1949

Native Cultivation

Crops	Buganda Province		Eastern Province		Northern Province		Western Province		TOTALS	
	1948	1949	1948	1949	1948	1949	1948	1949	1948	1949
Beans, Mixed	87,173	142,731	142,872	141,282	67,115	50,650	117,874	99,164	415,034	433,827
Beans, Soya	10,684	16,108	...	...	...	...	5,306	6,335	15,990	22,443
Cassava	90,364	95,340	184,837	165,700	138,847	128,235	84,261	93,697	498,309	482,972
Chillies	494	2,372	...	...	...	...	63	34	557	2,406
Coffee, *Arabica*	2,260	1,700	9,600	8,500	...	...	3,315	4,711	15,175	14,911
Coffee, *Robusta*	146,037	147,096	600	1,050	...	...	3,845	3,869	150,482	152,015
Cotton	476,710	527,897	767,826*	695,451*	266,962†	363,743†	43,873	41,427	1,555,371	1,628,518
Flax	...	...	...	...	...	...	3,335	1,602	3,335	1,602
Grams	44,043	9,109	15,500	...	...	...	...	...	59,543	9,109
Groundnuts	57,883	72,609	216,019	153,182	48,734	60,838	23,978	31,374	346,614	318,003
Maize	141,366	156,970	74,067	74,712	36,855	33,925	43,497	49,036	295,785	314,643
Millet, Sorghum	25,458	10,055	124,116	148,794	143,477	159,162	112,810	140,095	405,861	458,106
Millet, Finger	15,182	16,257	612,557	699,091	280,521	342,384	121,200	128,537	1,029,460	1,186,269
Millet, Bulrush	...	...	3,045	6,300	365	...	...	...	3,410	6,300
Onions	...	121	...	...	...	...	2,044	2,161	2,044	2,282
Peas, Pigeon	...	...	...	400	157,634	209,482	789	868	158,423	210,750
Peas, Field	...	...	...	50	...	...	34,728	31,830	34,728	31,880
Plantains	281,583	479,774	254,900	271,900	1,282	1,655	76,755	91,345	614,520	884,674
Potatoes, Sweet	116,948	122,766	179,163	157,999	86,537	83,142	145,192	142,063	527,840	505,970
Potatoes, English	2,365	577	395	705	...	...	4,302	6,047	7,062	7,329
Rice	...	...	23,624	25,812	3,733	3,719	1,672	1,264	29,029	30,795
Simsim	5,023	6,492	29,819	29,932	189,431	204,893	7,891	6,796	232,164	248,113
Tobacco, Fire-cured	668	1,269	...	...	...	...	6,928	4,076	7,596	5,345
Tobacco, Flue-cured	...	...	...	...	264	437	...	...	264	437
Tobacco, Air-cured	...	...	...	...	431	858	...	...	431	858
Tobacco, Nicotine	...	...	...	...	...	...	2,765	2,957	2,765	2,957
Wheat	...	...	1,383	1,509	...	...	1,004	920	2,387	2,429
TOTALS ...	1,504,241	1,809,243	2,665,021	2,582,369	1,402,013	1,643,123	847,428	890,208	6,404,179	6,924,943

* Excluding Kumam County. † Including Kumam County.

Crop Production 1949

Quantities Marketed and Estimated Values—Native Production

Crop	Buganda Province		Eastern Province		Northern Province		Western Province		Protectorate Totals	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
	Tons	£	*Tons*	£	*Tons*	£	*Tons*	£	*Tons*	£
Beans, Mixed	4,117	35,907	...	...	4	50	106	802	4,227	36,759
Beans, Soya	2,584	31,835	...	...	...	...	543	6,081	3,127	37,916
Castor, Seed	635	16,633	...	...	...	...	37	430	672	17,063
Chillies	213	18,424	...	...	...	...	10	560	223	18,984
Coffee, *Arabica*	268*	7,182	2,857†	173,799	...	...	129	6,791	3,254	187,772
Coffee, *Robusta*	33,657*	847,340	24	627	...	...	308	13,699	33,989	861,666
Cotton	106,633	3,505,011	89,623	2,786,545	29,610	908,350	5,606	175,900	231,472	7,375,806
Flax, Straw	...	...	...	...	...	...	896	3,319	896	3,319
Flax, Seed	...	...	...	...	...	...	165	1,848	165	1,848
Grams	1,056	29,805	...	...	...	...	...	...	1,056	29,805
Groundnuts	1,321	29,590	5,956	133,315	2	56	1,459	22,681	8,738	185,642
Maize	40,676	227,790	5,857	32,721	...	...	573	3,209	47,106	263,730
Millet, Sorghum	199	2,008	...	...	...	...	...	...	199	2,008
Millet, Finger	51	562	...	...	...	...	...	...	51	562
Millet, Bulrush	...	...	...	...	...	...	...	...	...	...
Onions	...	...	...	...	...	...	330	3,688	330	3,688
Peas, Pigeon	...	...	...	...	...	...	...	...	...	...
Peas, Field	...	...	...	...	...	...	90	1,000	90	1,000
Potatoes, English	...	...	...	...	...	...	453	2,546	453	2,546
Rice	...	...	146	2,188	8	134	154	1,725	308	4,047
Simsim	157	3,512	79	1,769	36	806	18	375	290	6,462
Shea Butter Nuts	...	...	1,061	24,955	766	12,407	...	...	1,827	37,362
Tobacco, Fire-cured	318	15,353	...	...	...	...	707	32,591	1,025	47,944
Tobacco, Flue-cured	...	...	...	...	432	2,647	...	...	432‡	2,647
Tobacco, Air-cured	...	...	...	...	114	5,304	...	...	114	5,304
Tobacco, Nicotine	...	...	...	...	...	...	752	10,108	752	10,108
Wheat	...	...	...	...	...	...	142	1,594	142	1,594
TOTALS ...	191,885	4,770,952	105,603	3,155,929	30,972	929,754	12,478	288,947	340,938	9,145,582

* Dried cherry (Kiboko). † Parchment coffee. ‡ Green Leaf.

APPENDIX IV (*a*)

Exports of Domestic Produce, 1949

Article	Unit of Quantity	Quantity	Value
			£
OILSEEDS AND PRODUCTS—			
Cotton Seed	*Ton*	58,868	1,163,382
Castor Seed	,,	658	21,764
Groundnuts	,,	223	10,742
Linseed	,,	104	5,504
Cottonseed Cake	,,	9,313	170,860
Groundnut Cake	,,	...	...
Sesame Cake	,,	...	...
Castorseed Oil	,,	2	200
Edible Fats	,,	97	8,744
FIBRES—			
Cotton	*Bale*	390,258	17,342,765
Sisal	*Ton*	878	68,124
Flax	,,	75	8,184
BEVERAGE CROPS AND TOBACCO—			
Coffee, Raw Hulled	*Ton*	23,898	2,890,901
Tea	,,	1,025	223,087
Tobacco and Cigars	*Lb.*	267,822	16,444
Cigarettes	,,	623,543	75,550
SPICES AND DRUGS—			
Chillies	*Ton*	519	44,526
Cinchona Bark	,,	20	3,150
Papain	,,	50	51,711
SUGAR AND PRODUCTS—			
Sugar	*Ton*	2,309	52,914
Jaggery	,,	...	...
Ethyl Alcohol	*Proof Gal.*	53	12
BEANS AND PULSES—			
Beans and Peas	*Ton*	1,527	41,775
Pulses	,,	2,680	91,542
Dhall	,,	73	4,123
Soya Beans	,,	3,611	114,883
MISCELLANEOUS—			
Fish, dried and smoked	*Ton*	1,873	113,924
Insecticides	,,	34	30,192
Millet	,,	120	1,950
Rubber	,,	44	4,867
Timber	,,	3,615	60,703
Hides and Skins	,,	1,889	490,701
Salt	,,	1,489	6,881
Metal Ore	,,	152	42,614
Tin Ore	,,	185	75,338
Aluminium Ware	,,	152	49,102
Ivory	,,	23	30,359
Gold	*Oz. Troy*	696	6,621
All other items	...	...	1,191,143
	TOTAL £		23,443,282

Comparative Statement of Exports of Domestic Produce from the Uganda Protectorate

A. Quantities

	Unit	1945	1946	1947	1948	1949
Grain and Flour	*Cwt.*	119,420	181,718	144,801	9,240	2,398
Feeding Stuffs for Animals	*Ton*	721	1,266	1,344	7,101	12,626
Chillies	*Cwt.*	9,406	23,214	39,451	31,220	10,380
Coffee, Raw Hulled	,,	393,493	610,403	413,660	756,080	477,964
Salt	,,	29,078	36,374	30,936	26,180	29,778
Sugar, Refined	,,	221,343	191,239	384,604	622,080	46,182
Tea	,,	18,150	11,983	21,581	20,720	20,506
Other Articles of Food and Drink	*Value*	...	...	...	...	...
Cigarettes	*Lb.*	2,001,107	2,053,881	1,743,146	1,752,870	623,545
Tobacco, Manufactured	,,	24,707	36,796	17,505	} 315,845	267,822
Tobacco, Unmanufactured	,,	263,450	403,948	227,411		
Timber	*Cu.ft.*	37,090	317,007	123,938	131,220	3,615
Tin Ore	*Ton*	287	296	189	283	185
Cotton, Raw	*Cental*	1,057,818	876,779	1,012,323	697,028	1,561,032
Sisal, Fibre and Tow	*Ton*	998	1,055	677	1,183	878
Seeds, Cotton	,,	34,094	22,872	10,153	619	58,868
Seeds, Sesame	,,	...	...	...	...	...
Groundnuts	,,	...	3	2,106	3,209	223
Hides	*Cwt.*	21,043	16,280	30,632	} 12,380	37,795
Skins	*No.*	475,068	720,905	893,058		
Rubber	*Cental*	12,945	13,839	4,226	403	993
Ivory	*Cwt.*	570	696	433	520	461
Other Unmanufactured Articles	*Value*	...	...	...	...	...
Methylated Spirits	*Gal.*	1,352	1,244	738	13,606	53
Other Articles	*Value*	...	...	...	...	...
Gold Bullion	*Oz.*	2,751	2,490	1,432	369	696

NOTE.—Exports to Kenya and Tanganyika are not included.

B. Value—£

	£	£	£	£	£
Grain and Flour	85,992	191,995	228,887	7,455	1,950
Feeding Stuffs for Animals	4,771	12,982	18,662	128,317	233,509
Chillies	40,742	103,735	149,046	75,282	44,526
Coffee, Raw Hulled	1,143,211	1,767,448	1,535,707	3,246,664	2,890,901
Salt	4,966	6,477	7,880	5,603	6,881
Sugar, Refined	197,998	201,490	407,126	757,989	52,914
Tea	120,531	86,061	240,471	229,308	223,087
Other Articles of Food and Drink	67,133	...	90,445	486,445	43,352
Cigarettes	673,618	769,635	726,283	842,771	75,550
Tobacco, Manufactured	4,623	5,064	4,605	19,548	16,444
Tobacco, Unmanufactured	7,476	12,153	7,232		
Timber	12,502	103,690	41,368	36,723	60,703
Tin Ore	50,894	53,255	40,151	103,231	75,338
Cotton, Raw	7,025,774	5,620,079	7,118,962	7,457,617	17,342,765
Sisal	27,098	39,436	...	91,217	68,124
Seeds, Cotton	142,240	105,374	...	8,930	1,163,382
Seeds, Sesame	...	...	...	...	...
Groundnuts	...	52	65,198	120,149	10,742
Hides	80,742	94,273	266,026	530,693	490,701
Skins	60,042	184,395	207,831		
Rubber	48,629	53,988	21,177	18,356	4,867
Ivory	37,711	50,974	32,459	37,128	30,359
Other Manufactured Articles	73,170	...	103,156	117,878	354,827
Methylated Spirits	258	286	171	3,229	12
Other Articles	11,161	...	24,769	134,048	244,747
Gold Bullion	17,920	16,642	10,475	2,907	6,621
TOTAL £	9,939,202	9,479,444	11,447,680	14,461,488	23,443,282

APPENDIX V

Crop Production—Uganda

Non-Native Production—1949

Crop	Estimated Acreage		Estimated Production			
			Amount		Value	
	1948	1949	1948	1949	1948	1949
	Acres	*Acres*	*Tons*	*Tons*	£	£
Coffee	15,763	18,763	3,592	2,581*	281,928	227,247
Rubber ...	7,000	7,000	...	...	...	...
Sugar	25,790	26,700	64,708	46,108	1,358,868	1,021,695
Sisal	9,920	8,100	1,501	964	120,080	770,120
Tea	5,656	6,157	1,606	1,500	359,744	344,400
TOTALS ...	64,129	66,720	71,407	51,153	2,120,620	2,363,462

* 1948–49 Season

Principal Agricultural Legislation—1949

Ordinance No.	Legal Notice No.		Reasons
		COFFEE	
...	271	Coffee Export Duty Ordinance, 1943	To vary the rate of export duty on coffee in relation to f.o.b. Mombasa prices.
		COTTON	
17	...	Cotton (Amendment) Ordinance, 1949	To amend the provisions of the Cotton Ordinance in accordance with certain recommendations made by the Cotton Commission, 1948.
31	...	Cotton (Amendment) (No. 2) Ordinance, 1949 ...	To vary the period for which a cotton buying licence remains valid.
33	...	Lint Marketing Board Ordinance, 1949	To provide for the establishment of a Lint Marketing Board for the purpose of marketing and exporting lint and cotton seed.
...	282	Cotton Price Notice Board Rules	To make rules governing the form and display of raw cotton price notice boards.
...	283	Cotton Collectors (Chaluzi) Rules	To make rules governing the application for, issue and period of validity of cotton collectors licences.
...	272	Cotton Export Duty Ordinance	To vary the rate of export duty on cotton lint in relation to f.o.b. Mombasa prices.
...	273	Cotton Seed Export Duty Ordinance, 1946 ...	To vary the rate of export duty on cotton seed.
...	1	Cotton Zone Ordinance	To fix maximum ginning and baling charges for the 1948/49 season.
...	3	Cotton Zone Amendment Rules (1949)	To vary the minimum ginning outturn of seed from raw cotton ginned on behalf of middlemen and to fix charges for the handling, storage, insurance and bagging of such seed.
		DEFENCE REGULATIONS	
...	121	Defence (Controlled Produce) Regulations. 1943 ...	To control the allocation of BR cotton seed for use as fuel in ginneries, and to prohibit its sale except under permit.
...	209	...	To restrict the erection of machinery for processing vegetable oils and cake.
		PLANT PROTECTION	
...	162	Plant Protection Ordinance, 1937	To regulate the importation of plants and seeds with special reference to the control of pests and diseases.
		TEA	
...	250	Tea Cess Ordinance, 1946	To fix a cess of Shs. 1/60 per 100 lb. on all tea manufactured in the Protectorate.

Staff Postings—1949

A. ADMINISTRATIVE

Title	Name	Station	Period	Remarks
Director of Agriculture	A. B. KILLICK	Entebbe	26- 5-49—31-12-49	Returned from leave 26-5-49.
Deputy Director of Agriculture	T. Y. WATSON	Entebbe	1- 1-49—31-12-49	Acting Director of Agriculture: 1-1-49—26-5-49.
Assistant Director of Agriculture	T. R. HAYES	Entebbe	1- 1-49— 7- 6-49	Acting Deputy Director of Agriculture 1-1-49—26-5-49. Proceeded on leave pending retirement 7-6-49.
Senior Agricultural Officer	W. J. MILL IRVING	Entebbe	1- 1-49—31-12-49	Acting Assistant Director of Agriculture 1-1-49—26-5-49. Assistant Director of Agriculture from 7-6-49.
Office Superintendent	E. B. BUCKINGHAM	Entebbe	29- 9-49—31-12-49	Transferred from Kenya.
Secretary-Stenographer	MISS H. M. MCKINSTRY	Entebbe	24- 3-49—31-12-49	New appointment.

B. GENERAL DIVISION

Principal Agricultural Officer	W. T. O. MAIDMENT	Jinja	1- 1-49—26- 3-49	Proceeded on vacation leave pending retirement 27-3-49.
Senior Agricultural Officers	R. P. DAVIDSON	Lira	1- 1-49—26- 3-49	Proceeded on vacation leave 27-3-49.
		Kampala	22- 9-49—31-12-49	Provincial Agricultural Officer, Buganda 25-10-49—31-12-49.
	M. G. DE COURCY-IRELAND	Masindi	1- 1-49—31-12-49	Provincial Agricultural Officer, Western Province 1-1-49—31-12-49.
	R. K. KERKHAM	Kampala	2- 6-49—31-12-49	Returned from leave 2-6-49. Provincial Agricultural Officer, Buganda 7-6-49—31-7-49. Assistant Director of Agriculture (Special Development) 1-8-49—31-12-49.
	R. W. STUCKEY	Makerere	1- 1-49—11-11-49	Proceeded on leave pending retirement 12-11-49.
	T. MCEWEN	Masaka	1- 1-49—31-12-49	

Title	Name	Station	Period	Remarks
Senior Agricultural Officers—(continued)	H. L. G. MILNE	Arua ...	1- 1-49—21-11-49	Proceeded on leave 22-11-49.
	D. F. STEWART	Kampala ...	1- 1-49— 6- 6-49	Proceeded on leave 7-6-49. Returned from leave 3-11-49.
		Gulu ...	3-11-49—31-12-49	Provincial Agricultural Officer, Northern Province 22-11-49—31-12-49.
Agricultural Officers	E. WILLIAMS	Serere ...	1- 1-49—31-12-49	Senior Agricultural Officer with effect from 16-11-49.
	D. R. N. BROWN ...	Kabale ...	1- 1-49—10- 1-49	
		Entebbe ...	11- 1-49— 6- 3-49	
		Jinja ...	7- 3-49—31-12-49	Provincial Agricultural Officer, Eastern Province 23-3-49—31-12-49.
	J. W. PURSEGLOVE ...	Kabale ...	1- 1-49—31-12-49	
	J. M. WATSON	Moroto ...	1- 1-49—31-12-49	On leave 2-4-49—28-9-49.
	G. D. BADGER	Bukalasa ...	1- 1-49—31-12-49	
	S. MCCOMBE	Arua ...	5- 5-49—31-12-49	On leave until 4-5-49.
	R. K. TREMLETT	Mbale ...	1- 1-49—31-12-49	
	A. E. B. WILLIAMS ...	Kawanda ...	1- 1-49— 8- 6-49	Proceeded on vacation leave 9-6-49.
		Fort Portal	7-12-49—31-12-49	
	D. D. CAMPBELL	Soroti ...	1- 1-49—31-12-49	
	D. J. PARSONS	Jinja ...	1- 1-49—31-12-49	
	E. S. T. MARSHALL ...	Jinja ...	1- 1-49—20- 2-49	Proceeded on vacation leave 21-2-49.
		Bukalasa ...	15-10-49—31-12-49	
	G. WRIGLEY	Kampala ...	1- 1-49—31-12-49	
	P. S. COOPER	Hoima ...	1- 1-49—31-12-49	
	D. C. TODD	Jinja ...	1- 1-49— 5- 3-49	
		Moroto ...	6- 3-49—28- 9-49	
		Busoga ...	29- 9-49—31-12-49	
	J. W. HEXT	Jinja ...	—	On leave. Resigned with effect from 19-4-49.
	W. H. EDWARDS	Kawanda ...	17- 6-49—31-12-49	
	R. G. HAMPSON	Mbarara ...	2- 9-49—31-12-49	New appointment.
Senior European Agricultural Assistants ...	J. F. LOW	Serere ...	1- 1-49—31-12-49	On leave 9-2-49—21-8-49.
	R. W. MALING	Kampala ...	1- 1-49—31-12-49	
	E. DE C. CHISHOLM ...	Kawanda ...	3- 7-49—31-12-49	Returned from leave 3-7-49.
	V. A. BUNGE	Serere ...	1- 1-49—30- 9-49	Transferred to Veterinary Department with effect from 1-10-49.

European Agricultural Assistants ...	T. BOOTHROYD	Kampala ...	14- 7-49—31-12-49	Returned from leave 13-7-49. Senior European Agricultural Assistant with effect from 17-9-49.
	G. OLIVER	Kawanda ...	1- 1-49—10- 3-49	Proceeded on vacation leave.
		Lira ...	5- 9-49—31-12-49	
	L. B. ELLIS	Bukalasa ...	1- 1-49— 1- 2-49	Proceeded on vacation leave.
		Kawanda ...	14- 8-49—31-12-49	
	T. G. DUNCAN	Kampala ...	1- 1-49—25- 7-49	
		Masaka ...	25- 7-49—31-12-49	
	J. G. WILSON	Serere ...	29- 8-49—31-12-49	New appointment.
	A. F. BROWN	Serere ...	4- 9-49—31-12-49	New appointment.
	L. GREEN	Kisizi ...	1- 3-49— 6-12-49	New appointment.
		Kawanda ...	6-12-49—31-12-49	
	J. P. M. BATTEN	Serere ...	4-12-49—31-12-49	New appointment.
	A. G. K. WILL	Mbale ...	24- 2-49—31-12-49	New appointment.
Flax Officer	G. A. FENNELL	Kisizi ...	1- 1-49—31-12-49	On leave 17-4-49—12-11-49.
Ginning Inspector	F. H. KNIGHT	Soroti ...	1-11-49—31-12-49	New appointment.
Secretary-Stenographer	MRS. J. BECKETT	Kawanda ...	1- 1-49—31-12-49	